

## **REMARKS**

### **Overview of the Office Action**

The Office Action indicates that the specification should be updated to reflect the current status of all referenced patent applications.

Claims 48-74 have been objected to being in improper form.

Claims 38-47 have been rejected under 35 U.S.C. §112, second paragraph as indefinite.

Claims 38-47 have been rejected under 35 U.S.C. §101 for being improper process claims.

Claims 38-46 have been rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 4,183,316 ("Bennet").

Claim 47 has been rejected under 35 U.S.C. §103(a) as unpatentable over Bennet in view of GB 2 063 776 ("Duke").

### **Claim Status**

Claims 1-37 have been previously canceled.

Claims 38-74 have been amended.

Claims 38-74 remain pending.

### **Amendments to the specification**

The specification has been objected to for not including the current status of all cited patent applications. The specification has been amended to provide the current status of all cited patent applications. Applicants submit that this objection has now been overcome.

#### Objection to claims 48-74

The Office Action states that the claims have been objected to for being in improper form because the claims refer to two sets of claims with different features.

Claims 48-74 have been amended to be in proper form.

Applicants submit that this objection has now been overcome.

#### Rejection of claims 38-47 under 35 U.S.C. §112, second paragraph.

The Office Action states that claims 38-47 are indefinite for reciting a use without reciting any active, positive steps describing how the use is actually practiced.

Claims 38-47 have been amended to claim “An underwater buoyancy element”.

With respect to claim 47, the Office Action states that the phrase “said liquefied compound” has no clear antecedent. Claim 47 has been amended to remove the phrase “said liquefied compound”.

Applicants submit that these rejections have now been overcome.

#### Rejection of claims 38-47 under 35 U.S.C. §101

The Office Action states that the claims merely recite a use without reciting any active, positive steps describing how the use is actually practiced.

Claims 38-47 have been amended to claim “An underwater buoyancy element”.

Applicants submit that this rejection has now been overcome.

Rejection of claims 38-46 under 35 U.S.C. §102(b)

The Office Action states that Bennet teaches all of Applicants' recited elements.

Applicants disagree.

Independent claim 38 recites "an underwater buoyancy element, comprising: a buoyancy fluid having a density that is less than that of sea water, and that is confined in a rigid or flexible leaktight casing, wherein said buoyancy fluid is a compound that is naturally in a gaseous state at ambient atmospheric temperature and pressure, and in an entirely liquid state at the underwater depth to which said buoyancy element is immersed."

Bennet fails to teach or suggest "wherein said buoyancy fluid is a compound that is naturally in a gaseous state at ambient atmospheric temperature and pressure, and in an entirely liquid state at the underwater depth to which said buoyancy element is immersed", as recited in Applicants' claim 38.

Bennet teaches an apparatus for controlling the depth of an object submerged in a liquid medium that includes a sealed chamber means, joined to the object, which retains a working fluid and which has a variable external volume for displacing variable amounts of the medium. The apparatus of Bennet further includes a heat transfer device for controlling the external volume of the chamber by heating the working fluid to increase the external volume, and by cooling the working fluid to decrease the external volume (see abstract of Bennet).

The working fluid (16) of Bennet always includes a gaseous component and is never entirely in a liquid state because the purpose of the apparatus taught by Bennet is to have a variable buoyancy and this variable buoyancy is obtained by heating or cooling the gas component to increase or decrease the volume of the gas component and thereby facilitate a variable volume of the chamber confining the gas component. The variable chamber of Bennet

includes a wall, which is made of a flexible diaphragm (18). The movement of the diaphragm (18), which can urge outwardly from the interior of the chamber or respectively inwardly from the chamber, provides the variable volume (see col. 3, lines 15-25 of Bennet).

Specifically, Bennet teaches “control (12) includes a chamber (14) for enclosing a working fluid (16), fluid (16) being a fluid which is expandable when it is heated and contractible when it is cooled. Working fluid (16) comprises a gaseous fluid such as nitrogen or a noble gas such as argon” (see col. 2, lines 1-5 of Bennet).

Further, Bennet teaches “referring to FIG. 4, there is shown object (10) and control (12) submerged in liquid medium (28) to a depth below depth D, control (12) comprising all of the elements shown in FIGS. 1-3 except that instead of gaseous fluid (16), a two-state working fluid is employed which has a liquid component (32) and a gaseous component (34). The working fluid could comprise a single fluid which is maintained partially in a liquid state and partially in a gaseous state while object (10) is submerged. When element (20) is energized to raise object (10), the gaseous component (34) of the fluid increases and liquid component (32) thereof decreases. A two-state fluid of this type could comprise water or freon, and may provide greater efficiency in the operation of control (12) than a working fluid having only a gaseous state, where efficiency is defined as being the ratio of work done to move diaphragm 18 to the heat provided by heating element (20)” (see col. 4, lines 29-46 of Bennet).

Moreover, Bennet teaches “As an alternative to a single fluid having two states, the working fluid shown in FIGS. 4 and 5 could comprise a mixture of two fluids having different boiling points, one fluid being partially dissolved in the other. For example, liquid component (32) could comprise water, and gaseous component (34) could comprise ammonia, the amount of

ammonia dissolved in the water decreasing when heating element (20) is energized, and increasing when element (20) is deenergized” (see col. 4, lines 54-62 of Bennet).

In contrast to Bennet, Applicants’ recited underwater buoyancy element includes a fluid that is entirely in a liquid state at the underwater depth to which the buoyancy element is immersed. Applicants are not concerned with variable buoyancy and do not require a heater mechanism to heat the buoyancy fluid.

Thus, Bennet clearly fails to teach or suggest “wherein said buoyancy fluid is a compound that is naturally in a gaseous state at ambient atmospheric temperature and pressure, and in an entirely liquid state at the underwater depth to which said buoyancy element is immersed”, as recited in Applicants’ claim 38.

In view of the foregoing, Applicants submit that Bennet fails to teach or suggest the subject matter recited in independent claim 38. Accordingly, claim 38 is patentable over Bennet under 35 U.S.C. §102(b).

Claims 39-46, which depend from independent claim 38, incorporate all of the limitations of independent claim 38 and are therefore deemed to be patentably distinct over Bennet for at least those reasons discussed above with respect to independent claim 38.

#### Rejection of claim 47 under 35 U.S.C. §103(a)

The Office Action states that the combination of Bennet and Duke teaches all of Applicants’ recited elements.

Bennet has been previously discussed and does not teach or suggest the subject matter recited in Applicants’ independent claim 38.

Claim 47, which depends from independent claim 38, incorporates all of the limitations of independent claim 38 and is therefore deemed to be patentably distinct over Bennet and Duke for at least those reasons discussed above with respect to independent claim 38.

Conclusion

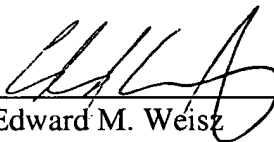
In view of the foregoing, reconsideration and withdrawal of all rejections, and allowance of all pending claims is respectfully solicited.

Should the Examiner have any comments, questions, suggestions, or objections, the Examiner is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of any outstanding issues.

Respectfully submitted,

COHEN PONTANI LIEBERMAN & PAVANE LLP

By



Edward M. Weisz

Reg. No. 37,257

551 Fifth Avenue, Suite 1210

New York, New York 10176

(212) 687-2770

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